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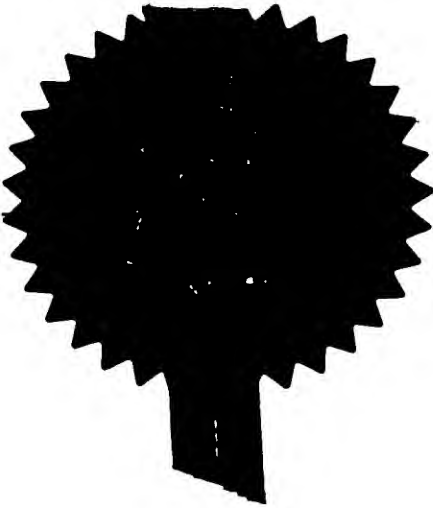
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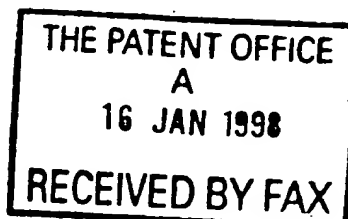
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9800884.03. Full name, address and postcode of the or of
each applicantThe Mead Corporation
Courthouse Plaza NE
Dayton
Ohio 45463

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4. Title of the invention

Packaging Machine and Method of Forming a Carton

5. Name of your agent

Hepworth Lawrence Bryer & Bizley

"Address for Service" in the United Kingdom
to which all correspondence should be sentBloxam Court
Corporation Street
Rugby
Warwickshire
CV21 2DU

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11. I/We request the grant of a patent on the basis of this application

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Date

Hepworth Lawrence Byrd Bish

16 January 1998

12. Name and daytime telephone number of person to contact in the United Kingdom.

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DUPLICATE

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PACKAGING MACHINE AND
METHOD OF FORMING A CARTON

This invention relates to a packaging machine which is especially suitable for processing multiple package cartons from blank form to completed filled multiple unit cartons and to a method of forming such cartons. The machine can be readily adjusted to accommodate a wide range of carton sizes without undue time being taken to adapt the machine for running one size of carton to running a different size of carton.

10 The majority of known packaging machines are dedicated machines which construct only size of one type of carton. Therefore, it is necessary to use a plurality of packaging machines to package different carton types, each machine taking up considerable floor space and being expensive to both purchase and operate.

15 In packaging machines which are required to construct cartons comprising internal compartments for holding a given number of articles, the construction of these cartons is often complex and often dictates the speed of the machine. What is required is a packaging machine which can construct compartments within a carton with a minimum number of folding operations.

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A further problem arises when loading the articles into the compartments and in particular where those compartments are in a spaced arrangement. It is known to provide article metering mechanisms which continuously load a group of articles into cartons, for example,

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wrap-around cartons used in beverage multiple packs. However, where carton compartments are in a spaced relationship, it is necessary for some form of article grouping to be adapted.

It is an object of the present invention to provide a packaging machine which overcomes the
5 technical and commercial disadvantages of known packaging machines.

In cartons where a display portion is provided, it is often desirable for display indicia to be shown through the display portion. The majority of known packaging machines are not able to orientate the display indicia on an article, for example, a label, so that it can be displayed.
10 A limited number of packaging machines incorporate equipment to orientate the containers. However, this equipment is usually complex or extremely costly for example, use of survey motors or optic fibre and a printed colour spot on the label to identify (i) a suitable reference point and (ii) to align the reference point at the correct position.

15 Thus it is a further object of the present invention to provide a mechanism for incorporation into a packaging machine which is capable of orienting containers for example, batteries, using equipment which is relatively inexpensive and simple.

According to a first aspect of the invention there comprises a packaging machine for loading
20 a plurality of articles into a carton which mechanism comprises carton erecting means for part erecting said carton to define a first article receiving cell, means for selecting a group of articles comprising at least two articles, means for separating said grouped articles from an adjacent like group of articles, means for loading said grouped articles into said first article

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receiving cell through an open end thereof in the packaged carton and a means for completing the construction of the carton.

According to an optional feature of this aspect of the invention a packaging machine as claimed in claim 1 wherein said carton erecting means comprises a device which effects a change in configuration of the carton from an inoperative configuration in which said first article receiving cell is formed to receive said grouped articles.

According to another option of this aspect of the invention, said carton erecting means comprises complementary die members, each said die member being mounted to a rotating wheel wherein each said complementing die member is adapted to interengage when a blank is positioned between the two members, such that said die members cause the blank to be folded to define said article receiving cells. Preferably one of said complementing members comprises a protruding portion extending from a working face of the complementing member and wherein the other said complementing member comprises a recessed portion adapted to receive said protruding portion and wherein the blank is placed on said receiving member and wherein the protruding portion forces part of the blank into said receiving portion.

According to another feature of this aspect of the invention said selecting means comprises a plurality of channels mounted on an endless chain which said channels are grouped to correspond to the number of articles to be placed into said first article receiving cell and wherein the channels are adapted to substantially align each said article with said first article receiving cell.

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According to another feature of this aspect of the invention, the carton comprises a second article receiving cell formed by said carton erecting means in a spaced relationship to said first article receiving cell wherein said grouped channels comprise at least two channels in substantially parallel relationship to one another wherein said at least two channels are adapted to diverge into a plurality of sub-groups wherein each said sub-group is spaced to align an article held in each said sub-group with one of said article receiving cells.

Optionally, the packaging machine of this aspect of the invention may further comprise a conveyor including means to convey the articles and means to regulate the flow of articles to enable the articles to be aligned with each said carton.

A second aspect of the invention provides a method of loading a plurality of articles into a carton whilst the articles and carton are moved in a synchronised manner and in a continuous forward direction comprising the following steps:

- i) transferring carton blank from a stowed position and erecting said blank;
- ii) selecting a group of articles to be loaded into said carton
- iii) synchronously associating an article receiving cell formed from the blank with a given number of said grouped articles by sideways movement of said articles;
- iv) transferring a carton and loading said grouped articles into a carton through an open end thereof.

A third aspect of the invention provides a mechanism for forming a carton including a pair of article receiving cells comprising complementary die members, each said die member being

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mounted to a rotating wheel wherein each said complementing die member is adapted to interengage when a blank is positioned between the two members, such that said die members cause the blank to be folded to define said article receiving cells.

5 According to a feature of this aspect of the invention, one of said complementing members comprises a protruding portion extending from a working face of the complementing member and wherein the other said complementing member comprises a recessed portion adapted to receive said protruding portion and wherein the blank is placed on said receiving member and wherein the protruding portion forces part of the blank into said receiving portion.

10

A further aspect of the invention provides a mechanism for grouping a plurality of articles which mechanism comprising an endless series of channels along which articles may be transferred into a plurality of article receiving cells of a carton wherein the channels are organised into groupings whereby each grouping corresponds to a given number of articles to
15 be loaded in the carton.

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According to a feature of this aspect of the invention the channels are adapted to be substantially parallel to one another and then diverge into sub-groupings wherein each said sub-group is spaced to align an article held in each said sub-group with one of said article receiving cells corresponding to each one of the cells of each carton and wherein the sub-groupings are each substantially parallel to one to provide in line parallel access to the cells.

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A fifth aspect of the invention provides a mechanism for causing a label affixed to an article to be oriented to a predetermined display position wherein the article includes a portion protruding outwardly of the article in a fixed position relative said label, wherein the mechanism comprises support means adapted to support an article, orientation means adapted to cause the article to rotate in the support means until the protruding position is restrained by abutment means formed in said support means.

Preferably, the mechanism as claimed in claim 13 wherein one edge of the label affixed to the article overlays an opposed edge of said label to define said protruding portion.

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According to a feature of this aspect of the invention, the support means comprises a channel including a support surface to retain part of the article within said channel. Preferably, said support surface substantially corresponds to the exterior surface of said retained part of the article.

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According to another optional feature of this aspect of the invention wherein the orientation means comprises an elongate member connected to resilient means, wherein said elongate member is adapted to abut a portion of said article as said support means is moved in a substantially parallel plane to said elongate member such that a tangential force is applied to said abutting portion of the article to cause the article to rotate. Optionally, said resilient means is adapted to reduce said tangential force when said protruding portion is restrained by said abutment means.

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According to a further optional feature of this aspect of this invention, the abutment means is formed from an upper edge of said channel.

5 A sixth aspect of this invention provides a method of orienting to a predetermined display position wherein the article includes an outwardly protruding portion in a fixed position relative said label a label affixed to an article which method comprising the steps of supporting the article in support means during forward movement, rotating the article within the support means until the protruding portion abuts a portion of the support means and retaining the article in its desired orientation for loading into a carton.

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An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

15 FIGURE 1 is a perspective view of a selection of "blister pack" type cartons packaged by a machine according to the invention;

FIGURE 2 is a plan view of a unitary blank used to construct one type of carton capable of being used with a machine according to the invention .

20 FIGURE 3 is a perspective view of one type of carton formed from the blank shown in Figure 2.

FIGURE 4 is a perspective view of a machine according to the invention;

FIGURES 5a and 5b are perspective views of the carton supply in-feed and set-up stations of the machine according to the invention;

- 5 FIGURE 6 is a perspective view of the carton conveyor and loading station of the machine- shown in Figure 4;

FIGURES 7 illustrates one type of article to be packaged by the machine according to the invention.

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FIGURES 8a, and 8b illustrate a mechanism for orientating the labels affixed to an article according to another aspect of the invention.

- The machine according to the present invention is capable of loading cartons comprising
15 compartments for retaining a given number of articles within each compartment. A selection of cartons(CA1 to CA6) suitable for being packaged by such a machine is illustrated in Figure 1.

- Figure 2 shows an example of a carton which can be constructed and laded by a packaging
20 machine of the present invention. Thus, there comprises a unitary blank (10) formed from paperboard or other suitable material, which blank (10) comprises a series of panels hinged one to the next. Thus support panel (12) is hingably connected to top panel (14) along fold line (30). Top panel (14) is connected by way of fold line (32) to side panel (16). Side panel

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hingably connected to second support panel (20) by means of fold line (36). In a set up condition, support panels (12, 20) are connected together in a face to face relationship by glue or other suitable means.

- 5 End panel (22) is hingably connected to side panel (16) along fold line (38) and strengthening panel (24) is hingably connected by means of fold line (40) to the opposing side of end panel (22). Likewise, end panel (26) is hingably connected to side panel (16) along fold line (42) and strengthening panel (28) is hingably connected to the opposing side of end panel (26) along fold line (44).

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In a set up condition, top panel (14), side panel (16), bottom panel (18) and a portion of support panel 20 co-operate to form a hollow display box. End panels (22, 26) provide closures for the box, with strengthening panels (24, 28) being secured, such as by gluing, to support panel (20) to maintain the box in set up condition. Side panel (16) provides a display
15 face for the package, while support panel (20) provides a back panel.

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The carton incorporates two securing cells or display windows (C1, C2) constructed from partition sections (96, 98) as illustrated in Figure 3. Turning again to Figure 2, partition section (96) is struck from side panel (16) and end panel (22) along opposing cut lines (50, 52). Partition section (96) is hinged to side strengthening panel (24) along fold line (40). When the carton is in a set up condition, this partition section will define an individual cell. . Likewise partition section 98 is struck from side panel (16) and end panel (22) along opposing cut lines (50, 52). Partition section (96) is hinged to side strengthening panel (24)

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along fold line (40). When the carton is in a set up condition, this partition section will define an individual cell.

It is envisaged that the carton can vary depending upon the shape and/or quantity of articles to be packaged and accordingly, a machine in accordance with the present invention is adjustable in numerous respects so that it can process a wide variety of such cartons and is not limited to the specific example outlined above.

Referring now to Figure 4 of the drawings, there is shown a machine for processing cartons (52) of the type outlined above. The upstream end of the machine includes a hopper (54) in which a multiplicity of cartons (52) in flat collapsed condition held ready for processing. As shown in Figures 4 and 5, the cartons are removed from the hopper (54) sequentially by a rotary vacuum feeder (56). The vacuum feeder (56) comprises four pairs of suction cups (58) each being connected to a drive shaft (60) by a drive rod (62). Driving means (64) for example a servo motor, is used to rotate the drive shaft (60). The drive shaft (60) can be connected to a cam track by a cam rod (not shown) to provide a uniform path with suction cups when the drive shaft (60) is rotated.

The hopper (54) is, in this embodiment, a 'gravity feed' type whereby the carton blank (52) are held on the hopper at an incline to provide a positive feed. Thus as shown in Figure 5, a carton in flat collapsed condition is removed from the hopper (54) and is rotated by the vacuum feeder (56) to the in-feed end of the machine (54). The blank is placed onto a pair of endless chains (66, 68), for example, side lug chains, and is held in position by suitable

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support means, for example leading and trailing lugs (70, 72) mounted upon the endless chains (66, 68) respectively. The lug sets (70, 72) maintain the position of the carton and move the carton downstream to the set-up station shown generally at 74.

- 5 The set-up station (74) is shown in Figure 5, and it includes a pair of rotating wheel units (76, 78) which, in this embodiment, are positioned above and below the carton. Of course, the position of the units is not limited to their position shown in the drawings. The rotating wheels (76, 78) can be powered by known driving means for example servo motors. In this embodiment, each rotating wheel unit (76, 78) comprises a pair of die members (80, 82, 84, 10 86) mounted to each rotating wheel by a shaft (88, 90). Each wheel unit (76, 78) in opposed positions includes cam track and cam as described below. In other embodiments, the rotating wheels (76, 78) can comprise more than two die members, if manufacturing requirements or the packaging speed dictate that such a modification be preferable. Turning to the construction of the die members (80, 82) of the upper wheel (76), it is envisaged in this 15 embodiment that both die members (80, 82) are identical in construction, so only one of the members (80) is described in any greater detail. As illustrated in Figures 5a and 5b, the upper rotating wheel (76) comprises a (male) die member formed from a substantially rectangular block (92) mounted to the rotating wheel (76) by a shaft (88). In use, the wheel rotates in direction "B" A protruding portion extends from the lower surface (100) of the block. In this 20 embodiment, the protruding portion is shaped to correspond to the width "W" between adjacent fold lines (35, 37), shown in Figure 3, and the remaining portion of the lower surface (100) is shaped to correspond to partition sections (96, 98) defining the article receiving cells C1, C2.

Likewise, the lower rotating wheel (78) comprises the corresponding (female) die member (84, 86) formed from a substantially rectangular block (102) mounted to the rotating wheel (78) by a shaft (90). In use, the wheel rotates in direction "C". The upper surface (104) of the block comprises a recessed portion (106) which is shaped to receive the corresponding protruding portion (94) from the lower surface (100) of block (92). As the carton blank (52) is moved forward by the endless chains (60, 68), the lower surface of the carton blank (52) comes into contact with the (female) die member (84 or 86).

Preferably, the block (92) mounted to the upper rotating wheel (76) is rotated in unison with the lower block (102). Thus, the upper block (92) can come into contact with the upper surface of the carton blank (52). As the upper and lower blocks (92, 102) continue to move in directions B and C respectively, the cam track and cam arrangement within the rotating wheels (76, 72) cause the blocks to interengage whereby the protruding portion (94) is received by the corresponding recessed portion (106). In this embodiment, the side panel (16) is thereby pushed in a downward direction and folded about fold lines (35, 37) to erect a pair of display windows or cells (C1, C2), as shown in Figures 5a and 5b. The upper and lower blocks (92, 102) are then separated to release the carton (52) as it moves forward to the loading station (150) by the leading and trailing lugs (70, 72) on the endless chains (66, 68).

It is envisaged that the setting up station (74) and the process of "punching" the carton into a part erected form is a continuous process so that the carton is moved in a continuous forward direction as the carton erecting operation is performed.

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If an alternative type of blister pack is required to be packaged, then the blocks (92, 102) can be connected to the rotating wheel units by suitable securing means (not shown), for example quick release mechanism, so that the blocks can be interchanged with a second pair of differently configured blocks which can be used to part erect a second carton type.

5

After the cartons have been part erected to define article receiving cells, they are successively transferred to the loading station (150) shown in Figure 4 by which the cartons move downstream by the pair of side lug chain sets (66, 68).

10 At the loading station 150, articles (A), for example batteries, are fed into the machine (50) by an end feed conveyor (152) and the line pressure of the batteries is controlled by an in feed star wheel (154), as is well known. Thereafter, the articles may be transferred from the end feed conveyor (152) to an article grouping conveyor (156) shown in Figure 6. The article grouping conveyor (156) separates the articles into groups of the correct number per blank by
15 means of a series of channels (158) mounted to an endless chain (160), which articles (A) can be transferred into a plurality of articles receiving cells, (C1, C2) (for example, two) of the carton.

As shown in Figure 6, the channels (158) are organised into groupings, for example, four,
20 whereby each grouping (162) corresponds to a given number of articles to be loaded in the carton. Suitable guide means (not shown), for example, guide rail and static guide, are used to push the articles in to the respective cells, and the grouping conveyor (156) is used to

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control the flow of articles (A) so that they can be introduced to the carton 52 at the same rate as the carton blank flow.

In the class of embodiments which include cartons with more than one article receiving cell, then the channels (158) are adapted to diverge into sub-groupings (164) whereby each sub-group (164) is spaced to align an article or articles (A) held in each sub-group (164) with one of the article receiving cells (C1, C2). As shown in Figure 6, each sub-grouping is shaped to provide channels (158) which are substantially parallel to corresponding article receiving cells (C1, C2) in order to provide in-line parallel access to the aforesaid cells.

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Optionally, the machine may include a mechanism (200) shown in Figure 8 for causing a label (202) affixed to an article (A) to be oriented to a pre-determined display position.

Preferably, the articles to be packaged include a portion protruding (203) outwardly of the article in a fixed position relative said label. As shown in Figure 7, the protruding portion

15 (204) is formed by the side edges (206, 208) of the label (202) being placed in an overlapping relationship. As the articles are moved forward, they are inserted in to support means (210) adapted to support the articles (A). As shown in Figure 8a, the support means (210) comprises a group of channels (or holding combs) (212) adapted to receive part of an article.

In this embodiment, each channel comprises a support surface (214) which substantially
20 corresponds to the shape and configuration of the outer surface of the article (A). Of course, the different profiles of channel can be used, for example, a square d section, without departing from beyond the scope of the invention. Adjacent each channel (212) there comprises abutment means (216) adapted to restrain the protruding portion (204) of the

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article. In this embodiment, a surface (218) connecting adjacent channels (212) is used as the abutment (or pre-set stop) means (216).

Referring again to Figure 8a, each channel (204) is loaded with an article and the articles are successively moved forward to the orientation means (220) which is adapted to cause the articles to rotate in the support means (210). The orientation means (220), illustrated in greater detail in Figure 8b, comprises an elongate member (222) held in a fixed position relative to the channels (212). The elongate member (222) (or static member) can comprise a strip (224) including a working surface (226). Alternatively, the elongate member (222) can comprise a flexible belt (not shown) held in a fixed position, or driven in a direction substantially opposed to direction "Z" shown in Figure 8b. The working surface (226) preferably includes a layer of friction inducing material (228), for example, rubber or other suitable plastic materials. The strip is connected to a support frame (not shown) by resilient means (230), for example, a spring mechanism. Preferably, the length of the strip (224) should be equal to or greater than the circumference of the article (A) being rotated to ensure that each article can be rotated by up to 360 degrees.

As shown in Figure 8b, the articles and channels (204) are moved in direction "Z" and are brought into contact with the orientation means (220). Therefore, the strip (224) comes into contact with the upper portion of the article and as it is fixed relative the articles and channels (204) a tangential force is applied by the orientation means (220) to the articles which causes them to rotate. The channels (204) continue to move forward and the articles (A) continue to

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rotate until the protruding portion (203) comes into abutment with the abutment means (216).

Thus, the article is orientated to the correct position and can then be loaded into the cartons.

Once the article (A) has been oriented to its correct position, the increased resistance of the

5 article when it ceases to rotate applies an upward force to the strip (224). The resilient means (230) is used to reduce the tangential forces applied to the article (A) by the orientation means (220), whereby the strip (224) is capable of being moved by small amounts in a vertical plane "Y" in order to prevent or at least minimise the prospect of a carton label (202) being torn or damaged.

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It is envisaged that the article orienting mechanism can be incorporated into a machine described above, for example, at the upstream end of the grouping conveyor. It is further envisaged that this mechanism can be used in various types of packaging machines.

Alternatively, the article orienting mechanism of the present invention can be sold as an
15 individual module to be fitted to new equipment or to existing equipment on a retro fit basis.

At the loading station (150) shown in Figure 6, the groups of articles or sub-groupings are introduced to the carton from one side as the carton and article group are moved forward in unison. The lateral movement of the carton in the loading station is controlled by a pair of
20 guides (159, 161) positioned adjacent the end panels (22, 26) of each carton. It is envisaged that in other embodiments a pressure belt could replace fixed guides or, where appropriate, those particularly mounted endless chain and lug sets could be used.

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Once the cartons have been loaded with articles, they are transferred by means of a conveyor (163) and/or a pressure belt to a further set of endless chains (165) with side lugs which are used to transfer the carton to the outfeed end of the machine shown, in Figure 4. During this stage, the second support panel (20) is folded upwardly, and around the articles, by means of a fixed guide (not shown). Further, the end panels (22, 26) are folded about fold lines (38, 42) to enclose the article receiving cells (C1, C2) by a folding wheel (167) and glue flaps (24, 28) are connected to the cells (C1, C2) by glue or other means known in the art. Support panel (12) is then folded and secured to panel (20) by suitable securing means, for example glue or other means known in the art. Thereafter, pressure belts (169) can be applied to the carton to secure the panels in place and to complete the forming process.

Further modifications may be made without departing from the scope of the present invention. In particular, alternate sensors and alternate means of positioning each of the moveable articles may be utilised without departing from the scope of the invention as claimed in the accompanying claim. In addition, while the preferred embodiment described herein is for loading batteries into cartons, it will be recognised that the invention is not limited to cartons for batteries. The invention may be used with the machines for packaging cans, paperboard bricks, bottles and other containers into cartons. Further, the present invention is able to process cartons comprising numerous configurations of groups of articles covering a range of carton sizes and shapes, for example two, four, six or eight articles, without undue time being spent in adjusting the mechanism.

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CLAIMS

1. A packaging machine for loading a plurality of articles into a carton which mechanism comprises carton erecting means for part erecting said carton to define a first article receiving cell, means for selecting a group of articles comprising at least two articles, means for separating said grouped articles from an adjacent like group of articles, means for loading said grouped articles into said first article receiving cell through an open end thereof in the packaged carton and a means for completing the construction of the carton.
2. The packaging machine as claimed in claim 1 wherein said carton erecting means comprises a device which effects a change in configuration of the carton from an inoperative configuration in which said first article receiving cell is formed to receive said grouped articles.
3. The packaging machine as claimed in claims 1 or claim 2 wherein said carton erecting means comprises complementary die members, each said die member being mounted to a rotating wheel wherein each said complementing die member is adapted to inter engage when a carton blank is positioned between the two members, such that said die members cause the blank to be folded to define said article receiving cells.
4. The packaging machine as claimed in claim 3 wherein one of said complementing members comprises a protruding portion extending from a working face of the complementing member and wherein the other said complementing member comprises a

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recessed portion adapted to receive said protruding portion and wherein the blank is placed on said receiving member and wherein the protruding portion forces part of the blank into said receiving portion.

- 5 5. The packaging machine as claimed in any of claims 1 to 4 wherein said selecting means comprises a plurality of channels mounted on an endless chain which said channels are grouped to correspond to the number of articles to be placed into said first article receiving cell and wherein the channels are adapted to substantially align each said article with said first article receiving cell.

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6. The packaging machine as claimed in claim 5 wherein the carton comprises a second article receiving cell formed by said carton erecting means in a spaced relationship to said first article receiving cell wherein said grouped channels comprise at least two channels in substantially parallel relationship to one another wherein said at least two channels are adapted to diverge into a plurality of sub-groups wherein each said sub-group is spaced to align an article held in each said sub-group with one of said article receiving cells.
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7. The packaging machine as claimed in any preceding claim further comprising a conveyor including means to convey the articles and means to regulate the flow of articles to enable the articles to be aligned with each said carton.
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8. A method of loading a plurality of articles into a carton whilst the articles and carton are moved in a synchronised manner and in a continuous forward direction comprising the following steps:

i) transferring carton blank from a stowed position and erecting said blank;

5 ii) selecting a group of articles to be loaded into said carton

iii) synchronously associating an article receiving cell formed from the blank with a given number of said grouped articles by sideways movement of said articles;

iv) transferring a carton and loading said grouped articles into a carton through an open end thereof.

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9. A mechanism for forming a carton including a pair of article receiving cells comprising complementary die members, each said die member being mounted to a rotating wheel wherein each said complementing die member is adapted to interengage when a blank is positioned between the two members, such that said die members cause the blank to be

15 folded to define said article receiving cells.

10. The mechanism as claimed in claim 9 wherein one of said complementing members comprises a protruding portion extending from a working face of the complementing member and wherein the other said complementing member comprises a recessed portion adapted to
20 receive said protruding portion and wherein the blank is placed on said receiving member and wherein the protruding portion forces part of the blank into said receiving portion.

21

11. A mechanism for grouping a plurality of articles which mechanism comprising an endless series of channels along which articles may be transferred into a plurality of article receiving cells of a carton wherein the channels are organised into groupings whereby each grouping corresponds to a given number of articles to be loaded in the carton.

5

12. The mechanism as claimed in claim 11 wherein the channels are adapted to be substantially parallel to one another and then diverge into sub-groupings wherein each said sub-group is spaced to align an article held in each said sub-group with one of said article receiving cells corresponding to each one of the cells of each carton and wherein the sub-

10 groupings are each substantially parallel to one to provide in line parallel access to the cells.

13. A mechanism for causing a label affixed to an article to be oriented to a predetermined display position wherein the article includes a portion protruding outwardly of the article in a fixed position relative said label, wherein the mechanism comprises support means adapted to

15 support an article, orientation means adapted to cause the article to rotate in the support means until the protruding position is restrained by abutment means formed in said support means.

14. The mechanism as claimed in claim 13 wherein one edge of the label affixed to the

20 article overlays an opposed edge of said label to define said protruding portion.

22

15. The mechanism as claimed in claim 13 or claim 14 wherein the support means comprises a channel including a support surface to retain part of the article within said channel.

5 16. The mechanism as claimed in claim 15 wherein said support surface substantially corresponds to the exterior surface of said retained part of the article.

17. The mechanism as claimed in any of claims 13 to 16 wherein the orientation means comprises an elongate member connected to resilient means, wherein said elongate member is
10 adapted to abut a portion of said article as said support means is moved in a substantially parallel plane to said elongate member such that a tangential force is applied to said abutting portion of the article to cause the article to rotate.

18. The mechanism as claimed in claim 17 wherein said resilient means is adapted to
15 reduce said tangential force when said protruding portion is restrained by said abutment means.

19. The mechanism as claimed in any of claims 13 to 18 wherein the abutment means is formed from an upper edge of said channel.

20

20. A packaging machine as claimed in any of claims 1 to 7 further comprising the mechanism of any of claims 13 to 19 to orientate said group of articles prior to loading the articles into the carton.

21. A method of orienting to a predetermined display position wherein the article includes an outwardly protruding portion in a fixed position relative said label a label affixed to an article which method comprising the steps of supporting the article in support means during
5 forward movement, rotating the article within the support means until the protruding portion abuts a portion of the support means and retaining the article in its desired orientation for loading into a carton.

22. The method as claimed in claim 8, further comprising the step, prior to step (ii) of
10 orienting a label as defined in claim 21.

24

ABSTRACT

A packaging machine for loading a plurality of articles into a carton which mechanism comprises carton erecting means for part erecting said carton to define a first article receiving cell, means for selecting a group of articles comprising at least two articles, means for separating said grouped articles from an adjacent like group of articles, means for loading said grouped articles into said first article receiving cell through an open end thereof in the packaging carton and a means for completing the construction of the carton. There also comprises a mechanism for forming a carton including a pair of article receiving cells comprising complementary die members, each said die member being mounted to a rotating wheel wherein each said complementing die member is adapted to interengage when a blank is positioned between the two members, such that said die members cause the blank to be folded to define said article receiving cells.

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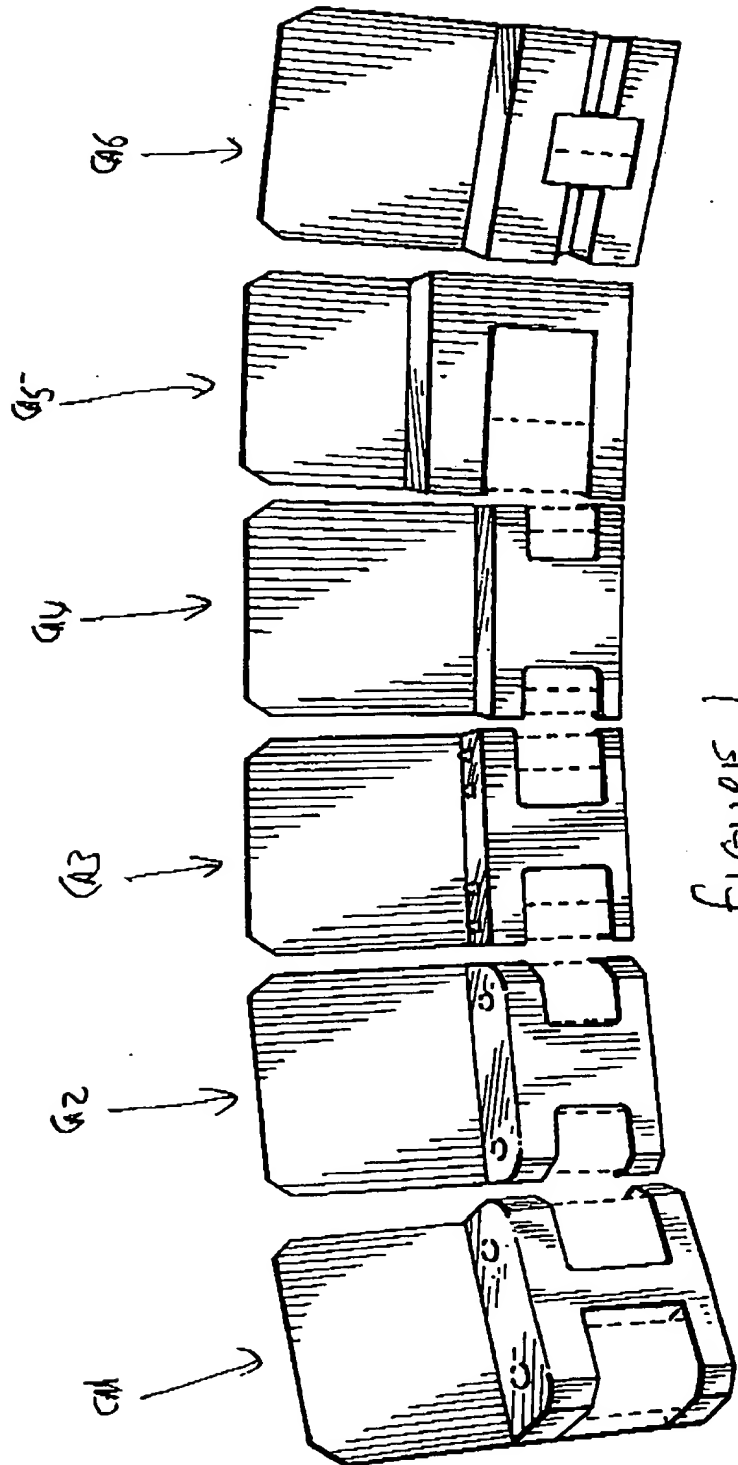


FIGURE 1

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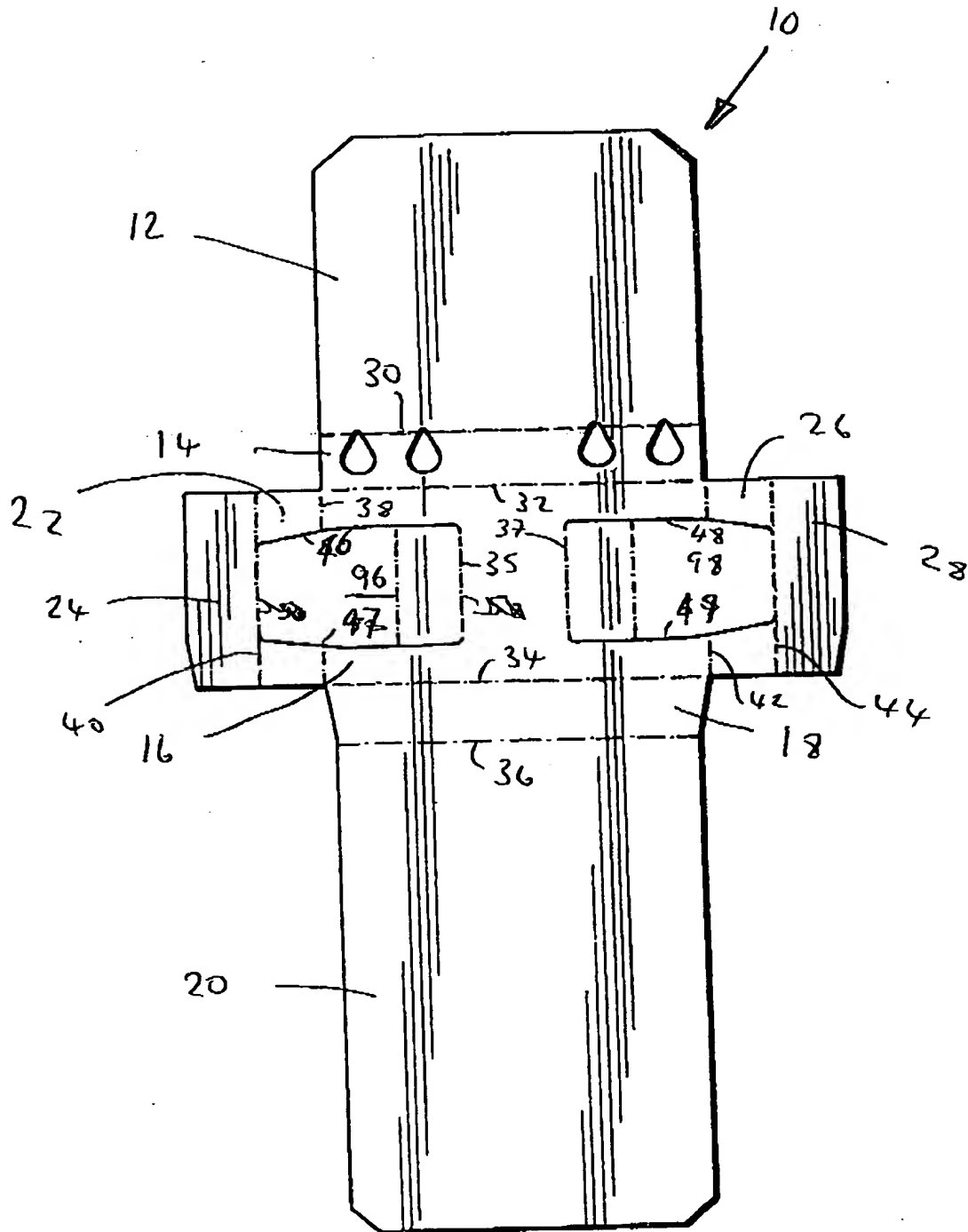


FIGURE 2

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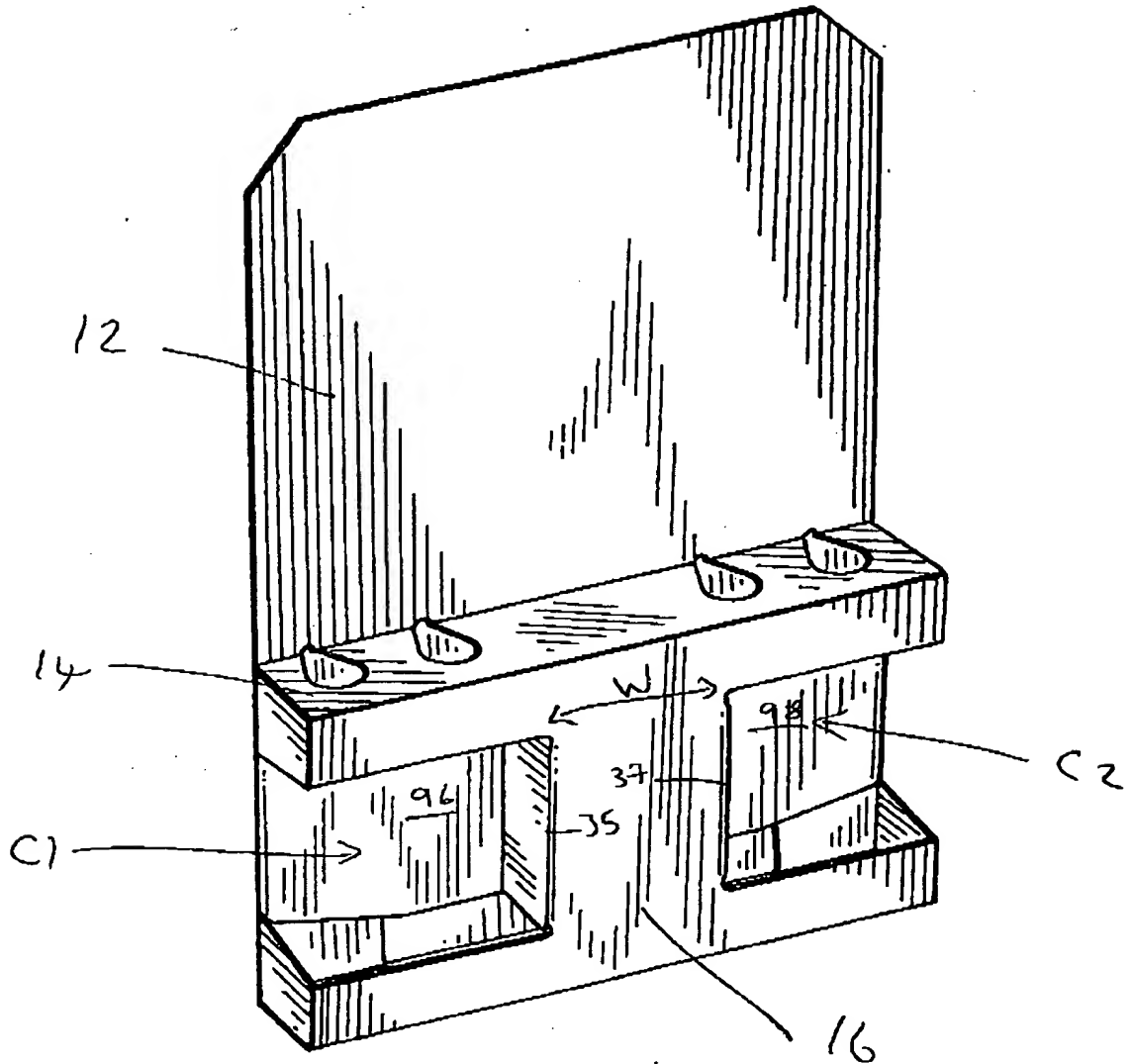
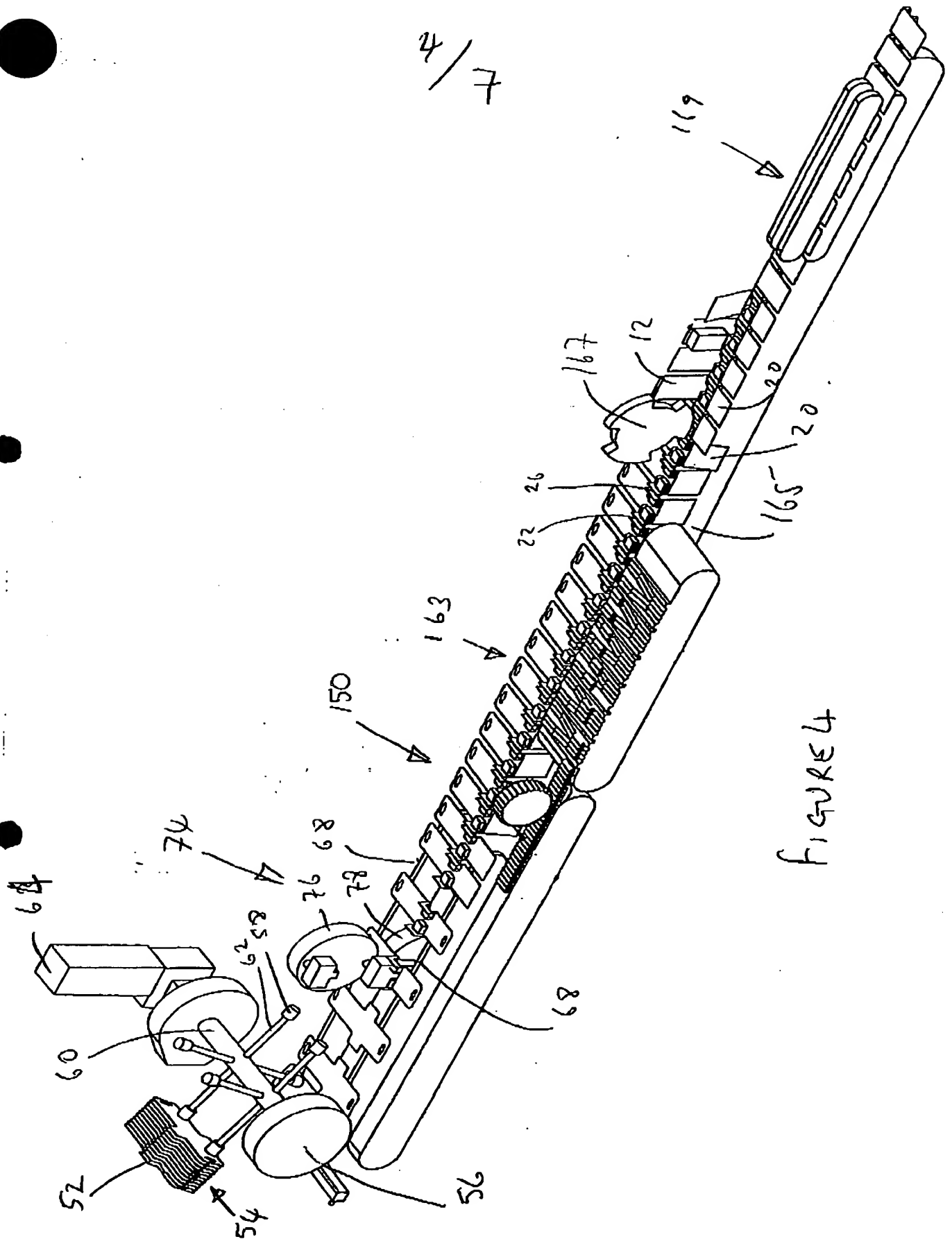


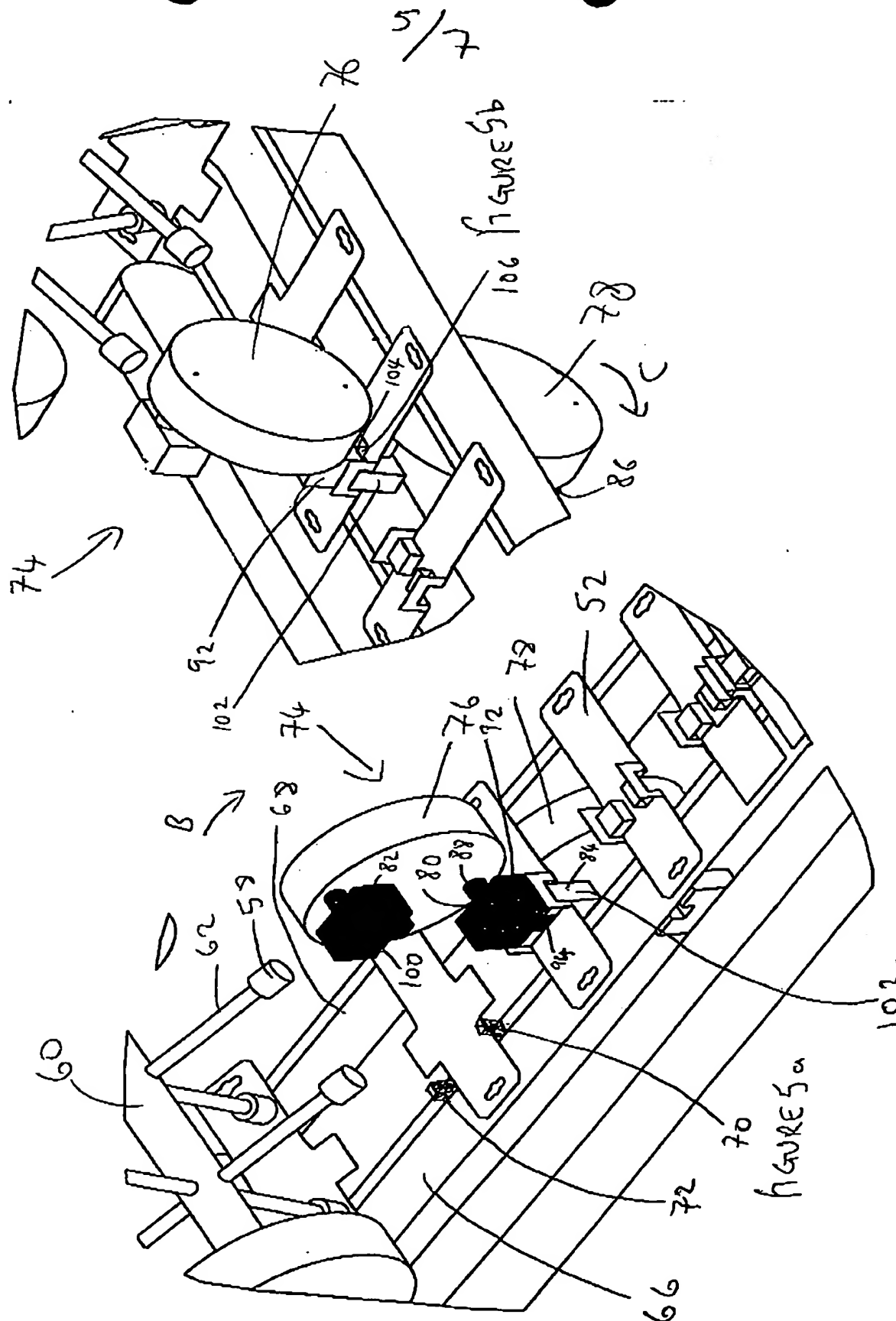
FIGURE 3

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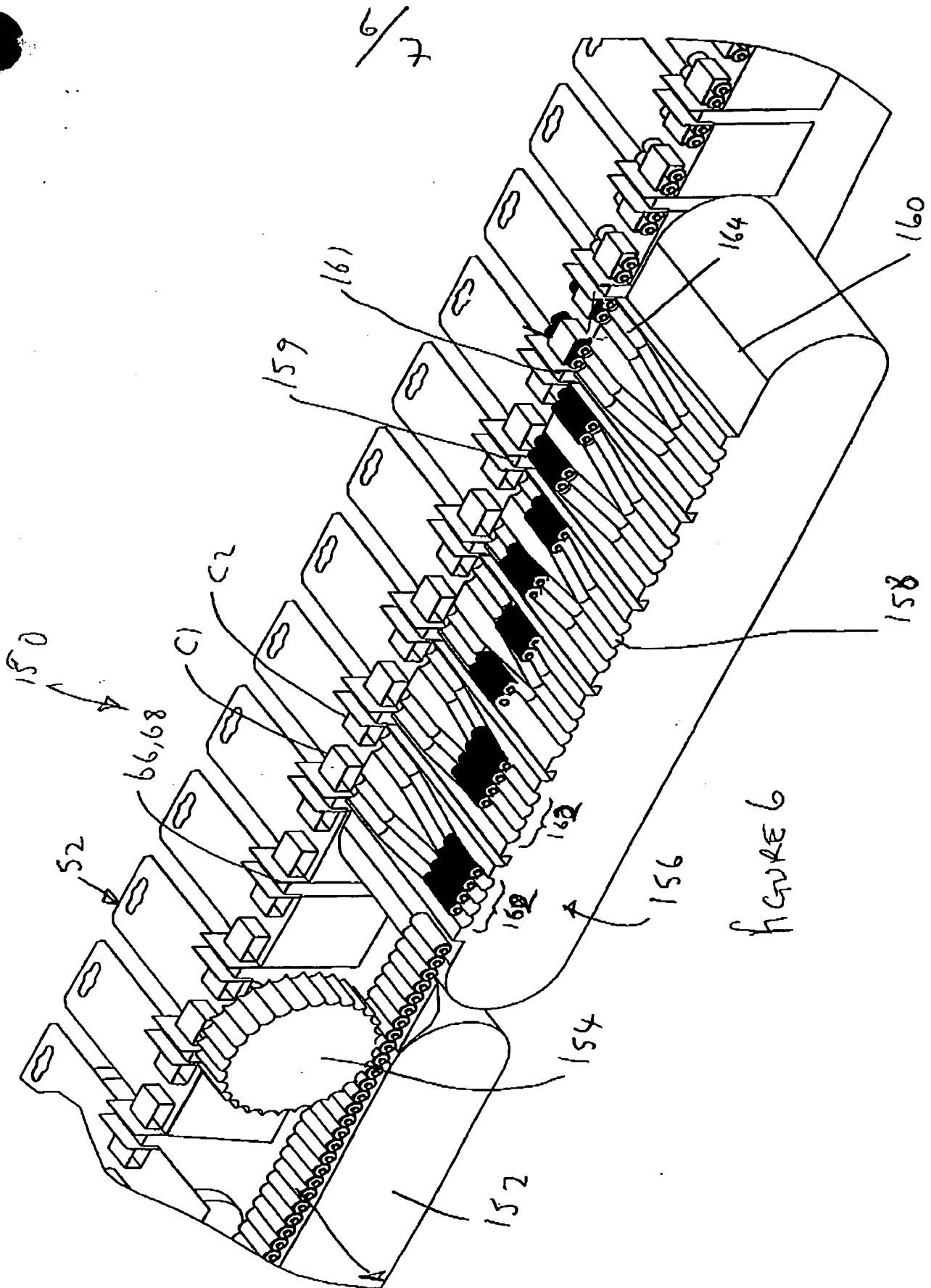
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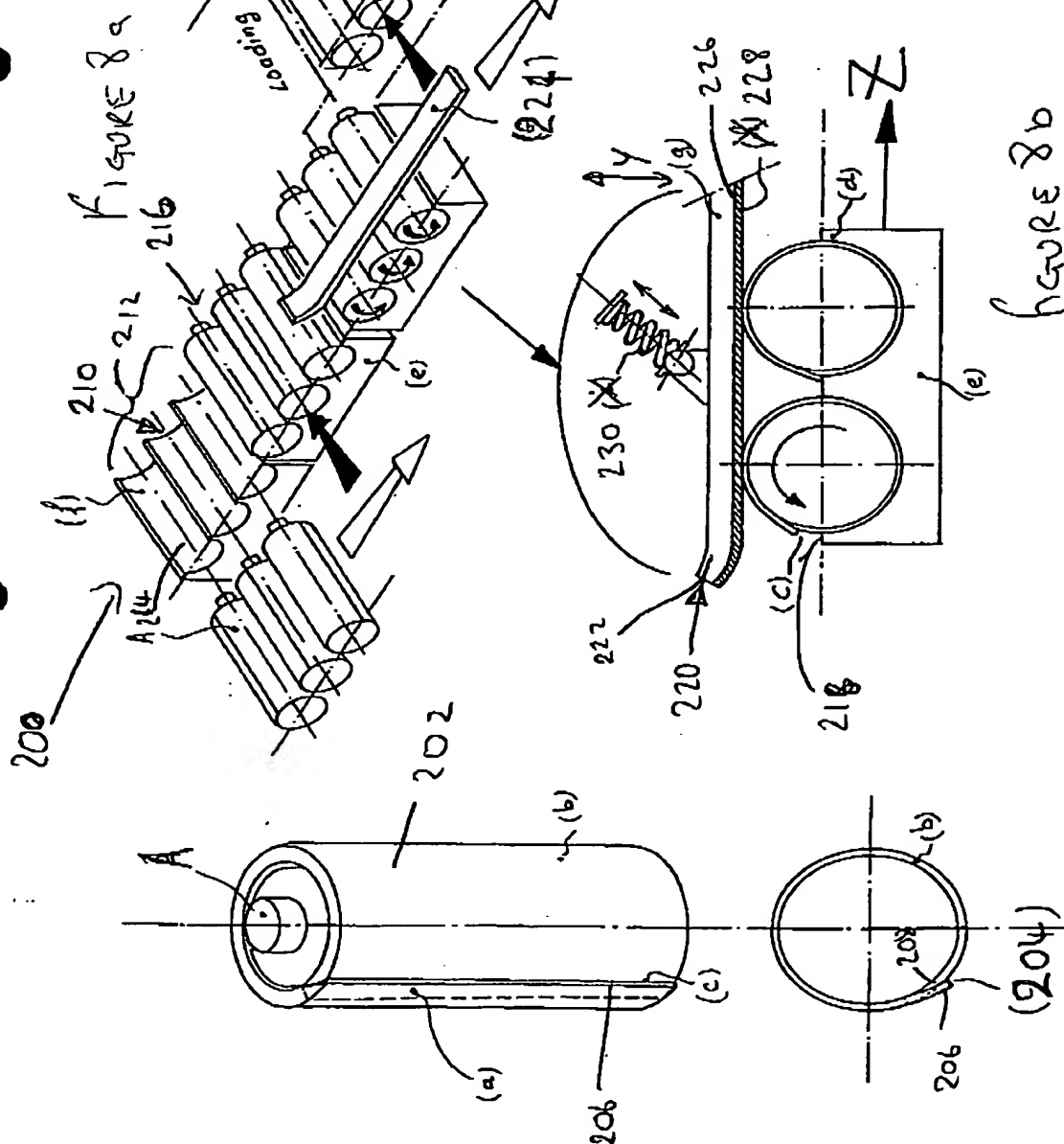
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